

WHAT IS CLAIMED IS:

- 5 1. A heterodimeric vascular endothelial growth factor II said heterodimer comprising an A subunit and a B subunit wherein said A subunit and said B subunit are encoded by different genes, with said growth factor being substantially free of other proteins.
- 10 2. A heterodimeric mammalian vascular endothelial growth factor II with an apparent non-reduced molecular mass of about 49,500 daltons, with said heterodimer made up of an A monomer having an apparent reduced molecular mass of about 27,000 daltons and a B monomer having an apparent reduced molecular mass of about 31,000 daltons wherein said A monomer and said B monomer are encoded by different genes, with said vascular endothelial growth factor  
15 substantially free of impurities.
- 20 3. The vascular endothelial growth factor II of claim 1 wherein the factor is mitogenic for mammalian vascular endothelial cells.
- 20 4. The vascular endothelial growth factor II of claim 2 wherein the factor is mitogenic for mammalian vascular endothelial cells.
- 25 5. Mammalian vascular endothelial growth factor comprising a homodimer comprising two B subunits with said endothelial growth factor substantially free of impurities and mitogenic for mammalian vascular endothelial cells.
- 30 6. Mammalian vascular endothelial growth factor II comprising an A subunit wherein said A subunit is selected from a group consisting of a 190 amino acid form, a 164 amino acid form, a 135 amino acid form, and a 120 amino acid form, and a B subunit encoded by the nucleotide sequence as shown in Figure 6 or Figure 7 and forms thereof which are mitogenic for human vascular endothelial cells, substantially free of impurities.

5 7. Vascular endothelial growth factor comprising two B subunits encoded by the nucleotide sequence as shown in Figure 6 or Figure 7 and forms thereof which are biologically active, substantially free of impurities.

10 8. A process for isolating mammalian heterodimeric vascular endothelial growth factor II in substantially pure form which comprises:  
a. isolating conditioned growth media containing VEGF II;  
b. cation exchange chromatography;  
c. lectin affinity chromatography;  
d. cation exchange high performance liquid chromatography;  
e. repeated reverse-phase high performance liquid chromatography; and  
15 f. collecting the substantially pure vascular endothelial growth factor II.

20 9. The process of Claim 8 for the isolation of vascular endothelial growth factor II from GS-9L cell culture fluid.

25 10. A pharmaceutical composition comprising a pharmaceutical carrier and an effective tissue repairing amount of the purified vascular endothelial growth factor II of Claim 1.

11. A pharmaceutical composition comprising a pharmaceutical carrier and an effective tissue repairing amount of the purified vascular endothelial growth factor II of Claim 2.

30 12. A pharmaceutical composition comprising a pharmaceutical carrier and an effective tissue repairing amount of the purified vascular endothelial growth factor of Claim 7.

13. A method of promoting tissue repair which comprises the administration to a patient in need of such treatment of an effective tissue repairing amount of the vascular endothelial growth factor II of Claim 1.

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14. A method of promoting tissue repair which comprises the administration to a patient in need of such treatment of an effective tissue repairing amount of the vascular endothelial growth factor II of Claim 2.

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15. A method of promoting tissue repair which comprises the administration to a patient in need of such treatment of an effective tissue repairing amount of the vascular endothelial growth factor of Claim 7.

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16. A method for stimulating growth of vascular endothelial cells which comprises treating vascular endothelial cells in a nutrient medium with vascular endothelial growth factor II at a concentration of about 0.1-100 ng/ml.

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17. A method for stimulating growth of vascular endothelial cells which comprises treating vascular endothelial cells in a nutrient medium with vascular endothelial growth factor of claim 7 at a concentration of about 1-1000 ng/ml.

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18. The method of Claim 16 wherein cells from a vascular explant are grown on a surface of a synthetic polymeric vessel for implanting in a host.

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19. The method of Claim 16 wherein endothelial cells from a vascular explant are grown on an interior surface of a biocompatible tubular mesh support and smooth muscle cells are grown on an external surface of the tubular mesh support for implanting in a host.

20. A method for preparing synthetic vessels comprising treating  
synthetic polymeric vessels with vascular endothelial growth factor II  
and implanting into a patient in need of such treatment after said  
implantation endothelial cells migrate into and grow on the artificial  
surface.

21. A method for the stimulation of the growth of vascular  
endothelial cells which comprises the administration to a patient in need  
of such treatment an effective growth promoting amount of vascular  
endothelial growth factor II whereby either vascular repair,  
neovascularization, or both is promoted.